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FOSSIL EVIDENCE OF A TAPACULO IN THE QUATERNARY OF CUBA (AVES: PASSERIFORMES: SCYTALOPODIDAE)

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Abstract.—Two bones from Quaternary cave deposits in the Isle of Pines and Camagüey Province, Cuba, are from a small species of tapaculo (Scytalopodidae = auct.) that was similar in size and morphology to modern species of *Scytalopus*. This is the only record of the family outside of South America, Panama, and Costa Rica, and the only record of the entire superfamily Furnarioidea in the West Indies. It presents a great zoogeographical anomaly because the species of *Scytalopus* are nearly flightless and appear to have little capability for dispersal over water.

When Olson was confronted with a humerus from cave deposits on the Isle of Pines (Isla de Juventud) that seemingly could have come from nothing other than a species of Scytalopodidae (=Rhinocryptidae auct., but see Brodkorb 1978:147, Feduccia and Olson 1982:3), he set the specimen aside in disbelief. Some five years later, Kurochkin visited the Smithsonian Institution and brought with him a tibiotarsus from a cave in Camagüey Province, Cuba, that he had at first tentatively identified as belonging to the Furnariidae, a related family also unknown in the Antilles. Recalling the humerus from the Isle of Pines, Olson suggested that the tibiotarsus be compared with the Scytalopodidae, with the result that it was found to match the corresponding element of *Scytalopus* very closely. The improbable reality of an Antillean tapaculo became too difficult to deny any longer. Here we present our evidence for the occurrence of the South America family Scytalopodidae in a zoogeographical subregion where no member of the superfamily Furnarioidea has hitherto ever been recorded, either living or fossil.

Order Passeriformes Linnaeus, 1758
Superfamily Furnarioidea Ames, 1971
Family Scytalopodidae Müller, 1846
?*Scytalopus* sp.
Fig. 1

Material examined.—Paleontological collections of the National Museum of Natural History, Smithsonian Institution, USNM 336505, proximal half of right humerus (proximal width, 3.9 mm). Caballos Mountains, Isle of Pines, Cuba. This specimen (Fig. 1a, c) was part of a fairly large lot of bird and mammal remains found among the collections of West Indian cave fossils in the Department of Paleobiology, National Museum of Natural History, Smithsonian Institution. These bore only locality data and as yet we know nothing more concerning their acquisition, although they were almost certainly obtained during the first three decades of this century, when Gerrit Miller was actively studying West Indian cave fossils.

Institute of Geology and Paleontology of the Academy of Sciences of Cuba, IGP 406-39, proximal third of left tibiotarsus (prox-

imal width through cnemial crest, 4.1 mm; proximal depth, 3.0 mm) (Fig. 1e). Collected at "Cueva de Los Fosiles," 28.5 km NE of Camagüey, Camagüey Province, Cuba, by E. N. Kurochkin and B. W. Woloszyn. This locality has previously been mentioned by Olson (1985a).

Age of the localities.—Nothing is known of the exact age of the humerus from the Isle of Pines. However, no cave deposits have been found anywhere in the West Indies that are known to be older than late Pleistocene and all are assumed to be Quaternary. The specimen appears to be unmineralized and the collections associated with it contained an abundance of *Rattus,* indicating that at least some of the deposition was post-Columbian. In all likelihood this specimen is Holocene in age and it could be very recent.

The tibiotarsus from Camagüey is definitely older, being from a bone breccia containing thousands of bones of the rodent *Geocapromeys columbianus,* as well as isolated remains of *Capromys pilorides, C. nana, Solenodon cubanus,* and Edentata. *Rattus* and *Mus* were absent in these deposits, which date from the first two (of three) pluvial periods of the Upper Pleistocene.

Comparative skeletal material of Scytalopodidae examined.—(Number of individuals in parentheses): *Scytalopus unicolor* (2, USNM), *S. femoralis* (1, USNM), *S. magellanicus* (1, USNM), *S. argentifrons* (3 partial, USNM), *Scelorchilus albicollis* (1, USNM; 1, AMNH), *Melanopareia elegans* (2, USNM), *Pteroptochus megapodius* (2, USNM), *P. tarnii* (1, USNM), *Rhinocrypta lanceolata* (2, AMNH).

Comparisons.—Both the humerus and the tibiotarsus in the Scytalopodidae are distinctive and easily separable from those of most other passerine birds (Feduccia and Olson 1982), being quite unlike any passerine known from Cuba. The fossil humerus from the Isle of Pines agrees with that in the Scytalopodidae in having the pectoral crest reduced, curved, and decidedly incised in palmar view (Fig. 1c). It is virtually identical to the humerus in *Scytalopus,* the only differences noted being that in ventral view the ventral tubercle is more pronounced and the edge of the bicipital crest runs slightly more perpendicular to the shaft. These differences would probably not prove to be of generic value if sufficient comparative material of the various species of *Scytalopus* were available.

The fossil tibiotarsus from Camagüey agrees with that in the Scytalopodidae in having the proximal end distinctly offset medially from the midline of the shaft and in having a distinct proximally situated crest on the medial side of the shaft, opposite the fibular crest, that is an extension of the inner cnemial crest. There is a deep fossa retrocristalis on the proximal articular surface and a deep fossa flexoria on the most proximal part of the caudal portion of the tibial head. This specimen, too, is very close in size and morphology to *Scytalopus,* but differs in the following respects: fibular crest longer, medial crest somewhat more distinct, inner cnemial crest with less prominent excavation on the anterior tip, ridge on the lateral side of the outer cnemial crest lacking, and inner cnemial crest not as narrow at the base. These differences are somewhat greater than between the fossil humerus and *Scytalopus* but might still fall within the range of variation in that genus. The specimen also shows some similarity to *Melanopareia.* Without more fossil and recent material we are hesitant to make a positive identification of the Cuban material as *Scytalopus.*

Discussion.—A tapaculo in Cuba presents an almost insurmountable zoogeographical anomaly. The family Scytalopodidae (containing 11 genera and 17 species) appears to be the most primitive group in the superfamily Furnarioidea (Feduccia and Olson 1982) and is restricted to South America, except for two species of *Scytalopus,* one found in eastern Panama and the other in western Panama and Costa Rica. The

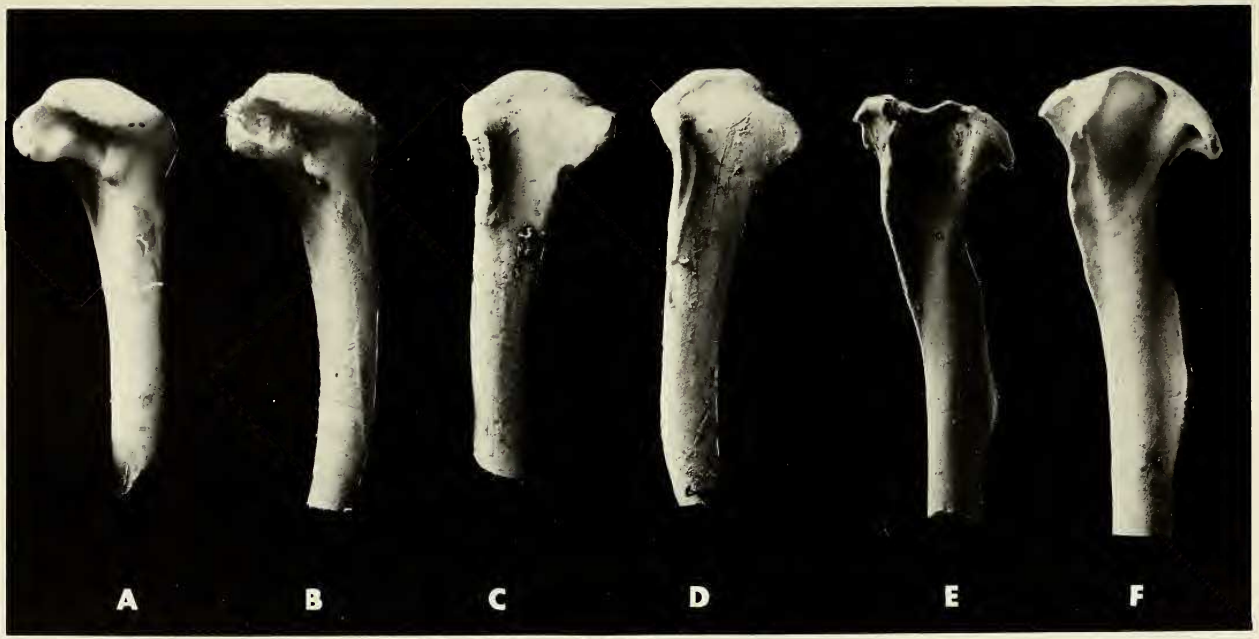

Fig. 1. Fossil specimens of ?*Scytalopus* sp. from Cuba and the Isle of Pines, compared with *Scytalopus unicolor* USNM 428900 (B, D, F): A, Proximal end of right humerus from Isle of Pines in anconal view (USNM 336505); C, Same, palmar view; E, Proximal end of left tibiotarsus from Camagüey Province, Cuba, in anterior view (IGP 406-39). The figures are ca. 5.5×.

family is most diverse in southern South America, with the more northern species tending to be montane in distribution.

The suboscine passerines (suborder Eurylaimi or Tyranni auct.), which includes the furnarioidea, and probably the entire order passeriformes, are believed to have originated in the Southern Hemisphere (Olson 1985b). There is no reason to believe that the Scytalopodidae would ever have been present in North or Middle America prior to the closing of the Panamanian seaway at the end of the Pliocene. (A supposed tapaculo from the Eocene of Wyoming does not even belong in the Passeriformes, much less to the Scytalopodidae [Feduccia 1976].) Thus, any tapaculo found in Cuba would probably have had to get there directly from South America.

As a group, the tapaculos are terrestrially adapted, with strong legs, reduced wings, and weak powers of flight. The species of *Scytalopus* are the smallest members of the family, being tiny, skulking, wren-like birds that are practically flightless. The pectoral apparatus in *Scytalopus* is very reduced, the sternum has only a vestigial keel, and the clavicles are unfused (Feduccia and Olson 1982). In short, of all the thousands of species of passerine birds in the world, the species of *Scytalopus* would seem to be among the very least capable of overwater dispersal. Furthermore, the Scytalopodidae belong to a large superfamily (or suborder, depending on one's views), Furnarioidea (Ames 1971), no member of which occurs anywhere in the West Indies.

The geological history of the Antillean region is extremely complex but there is still no convincing evidence of a former direct land connection between any of the Antilles and the mainland of either North or South America (Pregill 1981). Although various models propose the existence of a "proto-Antilles" in the position of present day Middle America (Rosen 1976, MacFadden 1980, Savage 1982), these have been projected as islands that received their fauna in stepping-stone fashion from continental areas. Even if this were the case, the avifauna of the Greater Antilles is preponderantly of North and Central American derivation, a point repeatedly emphasized by Bond (e.g. Bond 1934, 1948, 1963, 1978), whereas the Scytalopodidae are South American. Besides which, it would be just as difficult for a species of *Scytalopus* to get to a conjectural island and then to Cuba as to go there directly from the mainland of South America. Although drifting land masses have been proposed on an ad hoc basis to explain the occurrence of certain taxa in the Antilles, such as the Insectivora (MacFadden 1980), to have pieces of land randomly hurtling the odd taxon hither and yon about the Caribbean hardly seems an advance over the days when landbridges were constructed over most of the surface of the ocean for the same purposes.

Yet how did a tapaculo get to Cuba? We are left with the old hypothesis of rafting, which is an improvement over hypotheses of drifting land masses or of landbridges at least in that rafts of floating vegetation would surely be of more frequent occurrence than rafting land masses. Ground sloths evidently swam or were rafted directly from South America to the Greater Antilles, as the West Indian taxa are more closely related to Miocene sloths of South America than to the Plio-Pleistocene taxa of North and Central America (Paula Couto 1967). The fact that ground sloths did not colonize Jamaica is probably a result of that island's having been located farther west and having been submerged from the middle Eocene to the early Miocene (Buskirk 1985), a fact that provides some indirect evidence corroborating the probable time of arrival of ground sloths in the Greater Antilles. Presumably any factors that may have facilitated the dispersal of ground sloths at this time could have aided a tapaculo as well.

No species similar to *Scytalopus* has ever been reported historically in Cuba and it would seem likely that any such bird must

now be extinct. Given the possibly quite recent age of the specimen from the Isle of Pines, it is conceivable that the species existed into the historic period, only to fall prey to introduced predators such as rats, cats, and mongooses. However, because the two localities from which the Cuban tapaculo is known are nearly 500 km apart, it must once have been widespread and possibly may still exist in some remote mountainous area of the island.

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